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1 Substructural logic and partial correctness   ■

Dexter Kozen, Jerzy Tiuryn
July 2003 **ACM Transactions on Computational Logic (TOCL)**, Volume 4 Issue 3
Publisher: ACM Press
Full text available: 🗎 pdf(199.74 KB)   Additional Information: full citation, abstract, references, index terms

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Keywords: Dynamic logic, Hoare logic, Kleene algebra, Kleene algebra with tests, linear logic, sequent calculus, specification, substructural logic

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Keywords: interlock logic, pipeline stall, verification

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to propositional logic

Randal E. Bryant, Steven German, Miroslav N. Velev
January 2001 **ACM Transactions on Computational Logic (TOCL)**, Volume 2 Issue 1

Publisher: ACM Press

Full text available: 📄 pdf(319.93 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

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Keywords: decision procedures, processor verfication, uninterpreted functions

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November 1992 **Proceedings of the 1992 IEEE/ACM international conference on Computer-aided design ICCAD '92**
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Dexter Kozen
July 2000 **ACM Transactions on Computational Logic (TOCL)**, Volume 1 Issue 1
Publisher: ACM Press

Full text available: 📄 pdf(134.01 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

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Angelo Morzenti, Pierluigi San Pietro
January 1994 **ACM Transactions on Software Engineering and Methodology (TOSEM),** Volume 3 Issue 1
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Full text available: pdf(3.05 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

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Keywords: first-order logic, formal specifications, model-theoretic semantics, object-oriented methodologies, real-time systems, temporal logic

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Maher Mneimneh, Fadi Aloul, Chris Weaver, Saugata Chatterjee, Karem Sakallah, Todd Austin
June 2001 **Proceedings of the 38th conference on Design automation DAC '01**
Publisher: ACM Press

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We introduce a new verification methodology for modern micro-processors that uses a simple checker processor to validate the exe-cution of a companion high-performance processor. The checker can be viewed as an at-speed emulator that is formally verified to be compliant to an ISA specification. This verification approach en-ables the practical deployment of formal methods without impact-ing overall performance.

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Piero Bonatti, Sabrina De Capitani di Vimercati, Pierangela Samarati
February 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5 Issue 1
Publisher: ACM Press

Full text available: pdf(384.06 KB)   Additional Information: full citation, abstract, references, citings, index terms

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Keywords: Access control, algebra, logic programs, policy composition

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14 Essays in computing science
C. A. R. Hoare
January 1989 Book
Publisher: Prentice-Hall, Inc.
Full text available: pdf(20.91 MB)   Additional Information: full citation, abstract, references, cited by, review

Charles Antony Richard Hoare is one of the most productive and prolific computer scientists. This volume contains a selection of his published papers. There is a need, as in a Shakespearian Chorus, to offer some apology for what the book manifestly fails to achieve. It is not a complete 'collected works'. Selection between papers of this quality is not easy and, given the book's already considerable size, some difficult decisions as to what to omit have had to be made. Pity the editor weighin ...

15 Correctness proofs of distributed termination algorithms

Krzysztof R. Apt

June 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 8 Issue 3

Publisher: ACM Press

Full text available: pdf(1.21 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

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Publisher: ACM Press

Full text available: pdf(1.12 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

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Publisher: ACM Press

Full text available: pdf(1.73 MB)   Additional Information: full citation, references, citings, index terms

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July 1992 **Journal of the ACM (JACM)**, Volume 39 Issue 3

Publisher: ACM Press

Full text available: pdf(4.54 MB)   Additional Information: full citation, abstract, references, citings, index terms

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Keywords: Hoare logic, denotational semantics, dependency, information flow, optimizing compilation, partial equivalence relations, program analysis, security, types

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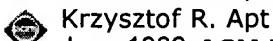
C. A. R. Hoare
January 1989 Book
Publisher: Prentice-Hall, Inc.

Full text available: 📄 pdf(20.91 MB)   Additional Information: full citation, abstract, references, cited by, review

Charles Antony Richard Hoare is one of the most productive and prolific computer scientists. This volume contains a selection of his published papers. There is a need, as in a Shakespearian Chorus, to offer some apology for what the book manifestly fails to achieve. It is not a complete 'collected works'. Selection between papers of this quality is not easy and, given the book's already considerable size, some difficult decisions as to what to omit have had to be made. Pity the editor weighin ...

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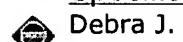
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1 On the correctness of orphan management algorithms   ▤

Maurice Herlihy, Nancy Lynch, Michael Merritt, William Weihl
October 1992 **Journal of the ACM (JACM)**, Volume 39 Issue 4
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Full text available: 🗎 pdf(3.83 MB)   Additional Information: full citation, abstract, references, citings, index terms

In a distributed system, node failures, network delays, and other unpredictable occurences can result in orphan computations—subcomputations that continue to run but whose results are no longer needed. Several algorithms have been proposed to prevent such computations from seeing inconsistent states of the shared data. In this paper, two such orphan management algorithms are analyzed. The first is an algorithm implemented in the Argus distributed-computing system at M ...

Keywords: Argus, atomic actions, avalon, camelot, input-output automata, recovery, serializability

2 Model checking and modular verification   ▤

Orna Grumberg, David E. Long
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Publisher: ACM Press

Full text available: 🗎 pdf(1.87 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

We describe a framework for compositional verification of finite-state processes. The framework is based on two ideas: a subset of the logic CTL for which satisfaction is preserved under composition, and a preorder on structures which captures the relation between a component and a system containing the component. Satisfaction of a formula in the logic corresponds to being below a particular structure (a tableau for the formula) in the preorder. We show how to do assume-guarantee-style reas ...

Keywords: CTL, Moore machines, computer-aided verification, formal verification, model checking, temporal logics

3 Formalizing the safety of Java, the Java virtual machine, and Java card

Pieter H. Hartel, Luc Moreau
December 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 4
Publisher: ACM Press

Full text available: pdf(442.86 KB)   Additional Information: full citation, abstract, references, citings, index terms

We review the existing literature on Java safety, emphasizing formal approaches, and the impact of Java safety on small footprint devices such as smartcards. The conclusion is that although a lot of good work has been done, a more concerted effort is needed to build a coherent set of machine-readable formal models of the whole of Java and its implementation. This is a formidable task but we believe it is essential to build trust in Java safety, and thence to achieve ITSEC level 6 or Common Crite ...

Keywords: Common criteria, programming

4 Security as a safety issue in rail communications
J. Smith, S. Russell, M. Looi
October 2003 **Proceedings of the 8th Australian workshop on Safety critical systems and software - Volume 33 SCS '03**
Publisher: Australian Computer Society, Inc.

Full text available: pdf(301.67 KB)   Additional Information: full citation, abstract, references, index terms

Systems whose failure can lead to the damage of property or the environment, or loss of human life are regarded as safety-critical systems. It is no longer adequate to build safety-critical systems based on the control of errors and failures alone. Safety-critical systems must also deal with securing the data that is used in their operation. While safety and security engineering have evolved separately, there are a number of similarities. These similarities and efforts to integrate safety and se ...

Keywords: formal methods, rail control, safety-critical systems, security, system safety

5 Evaluation of safety-critical software
David L. Parnas, A. John van Schouwen, Shu Po Kwan
June 1990 **Communications of the ACM**, Volume 33 Issue 6
Publisher: ACM Press

Full text available: pdf(1.62 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Methods and approaches for testing the reliability and trustworthiness of software remain among the most controversial issues facing this age of high technology. The authors present some of the crucial questions faced by software programmers and eventual users.

6 Session S9.2: embedded programs: Ensuring code safety without runtime checks for real-time control systems
Sumant Kowshik, Dinakar Dhurjati, Vikram Adve
October 2002 **Proceedings of the 2002 international conference on Compilers, architecture, and synthesis for embedded systems CASES '02**
Publisher: ACM Press

Full text available: pdf(127.10 KB)   Additional Information: full citation, abstract, references, citings, index terms

This paper considers the problem of providing safe programming support and enabling secure online software upgrades for control software in real-time control systems. In such systems, offline techniques for ensuring code safety are greatly preferable to online

techniques. We propose a language called Control-C that is essentially a subset of C, but with key restrictions designed to ensure that memory safety of code can be verified *entirely* by static checking, under certain system assumpti ...

Keywords: compiler, control, programming language, real-time, security, static analysis

7 Resourceful systems for fault tolerance, reliability, and safety
Russell J. Abbott
March 1990 **ACM Computing Surveys (CSUR)**, Volume 22 Issue 1
Publisher: ACM Press

Full text available: pdf(3.36 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Above all, it is vital to recognize that completely guaranteed behavior is impossible and that there are inherent risks in relying on computer systems in critical environments. The unforeseen consequences are often the most disastrous [Neumann 1986]. Section 1 of this survey reviews the current state of the art of system reliability, safety, and fault tolerance. The emphasis is on the contribution of software to these areas. Section 2 reviews current approaches to software fault ...

8 Software safety: why, what, and how
Nancy G. Leveson
June 1986 **ACM Computing Surveys (CSUR)**, Volume 18 Issue 2
Publisher: ACM Press

Full text available: pdf(4.18 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Software safety issues become important when computers are used to control real-time, safety-critical processes. This survey attempts to explain why there is a problem, what the problem is, and what is known about how to solve it. Since this is a relatively new software research area, emphasis is placed on delineating the outstanding issues and research topics.

9 Token coherence: decoupling performance and correctness
Milo M. K. Martin, Mark D. Hill, David A. Wood
May 2003 **ACM SIGARCH Computer Architecture News , Proceedings of the 30th annual international symposium on Computer architecture ISCA '03**, Volume 31 Issue 2
Publisher: ACM Press

Full text available: pdf(269.08 KB)   Additional Information: full citation, abstract, references, citings

Many future shared-memory multiprocessor servers will both target commercial workloads and use highly-integrated "glueless" designs. Implementing low-latency cache coherence in these systems is difficult, because traditional approaches either add indirection for common cache-to-cache misses (directory protocols) or require a totally-ordered interconnect (traditional snooping protocols). Unfortunately, totally-ordered interconnects are difficult to implement in glueless designs. An ideal coherenc ...

10 Formal verification in hardware design: a survey
Christoph Kern, Mark R. Greenstreet
April 1999 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 4 Issue 2
Publisher: ACM Press

Full text available: pdf(411.53 KB)   Additional Information: full citation, abstract, references, citings, index terms

In recent years, formal methods have emerged as an alternative approach to ensuring the

quality and correctness of hardware designs, overcoming some of the limitations of traditional validation techniques such as simulation and testing. There are two main aspects to the application of formal methods in a design process: the formal framework used to specify desired properties of a design and the verification techniques and tools used to reason about the relationship between a spec ...

Keywords: case studies, formal methods, formal verification, hardware verification, language containment, model checking, survey, theorem proving

11 Systematic concurrent object-oriented programming

Bertrand Meyer

September 1993 **Communications of the ACM**, Volume 36 Issue 9

Publisher: ACM Press

Full text available: pdf(7.19 MB)   Additional Information: full citation, references, citings, index terms

Keywords: Eiffel, concurrency, object-oriented concurrent programming

12 Controller synthesis for the "production cell" case study

Helmut Melcher, Klaus Winkelmann

March 1998 **Proceedings of the second workshop on Formal methods in software practice FMSP '98**

Publisher: ACM Press

Full text available: pdf(1.25 MB)   Additional Information: full citation, references, citings, index terms

Keywords: Case Study Production Cell, controller, specification, synchronity, synthesis

13 Modeling methodology b: Simulation and verification I: formal analysis of air traffic management systems: the case of conflict resolution and recovery

Ricky Butler, Jeffrey Maddalon, Alfons Geser, César Muñoz

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: pdf(199.07 KB)   Additional Information: full citation, abstract, references

New air traffic management concepts distribute the responsibility for traffic separation among the several actors of the aerospace system. As a consequence, these concepts move the safety risk from human controllers to the onboard software and hardware systems. One example of the new kind of distributed systems is air traffic conflict detection and resolution. Traditional methods for safety analysis such as human-in-the-loop simulations, testing, and flight experiments may not be sufficient i ...

14 Lutess: a specification-driven testing environment for synchronous software

L. du Bousquet, F. Ouabdesselam, J.-L. Richier, N. Zuanon

May 1999 **Proceedings of the 21st international conference on Software engineering ICSE '99**

Publisher: IEEE Computer Society Press

Full text available: pdf(1.28 MB)   Additional Information: full citation, references, citings, index terms

Keywords: Lustre, automated testing, behavioral patterns, operational profiles, synchronous reactive software, telecommunications systems

15 On developing and verifying design abstractions for reliable concurrent programming in Ada

A. Burns, A. J. Wellings, A. M. Koelmans, M. Koutny, A. Romanovsky, A. Yakovlev

March 2001 **ACM SIGAda Ada Letters , Proceedings of the 10th international workshop on Real-time Ada workshop IRTAW '00**, Volume XXI Issue 1

Publisher: ACM Press

Full text available: pdf(633.46 KB)   Additional Information: full citation, abstract

Ada 95 is an expressive concurrent programming language, which allows building large multi-tasking applications. Much of the complexity of these applications stems from the interactions between the tasks. Design abstractions (such as atomic actions, conversations etc.) have been proposed to deal with such complexity. This paper argues that Petri nets offer a promising, tool-supported, technique for checking the logical correctness of abstractions. The paper illustrates the effectiveness of this ...

16 Selected writings on computing: a personal perspective

Edsger W. Dijkstra

January 1982 Book

Publisher: Springer-Verlag New York, Inc.

Full text available: pdf(60.98 MB)   Additional Information: full citation, abstract, references, cited by, index terms

Since the summer of 1973, when I became a Burroughs Research Fellow, my life has been very different from what it had been before. The daily routine changed: instead of going to the University each day, where I used to spend most of my time in the company of others, I now went there only one day a week and was most of the time that is, when not travelling!-- alone in my study. In my solitude, mail and the written word in general became more and more important. The circumstance that my employe ...

17 Synthesis of fault-tolerant concurrent programs

Paul C. Attie, Anish Arora, E. Allen Emerson

January 2004 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 26 Issue 1

Publisher: ACM Press

Full text available: pdf(419.95 KB)   Additional Information: full citation, abstract, references, index terms

Methods for mechanically synthesizing concurrent programs from temporal logic specifications obviate the need to manually construct a program and compose a proof of its correctness. A serious drawback of extant synthesis methods, however, is that they produce concurrent programs for models of computation that are often unrealistic. In particular, these methods assume completely fault-free operation, that is, the programs they produce are fault-intolerant. In this paper, we show how to mechanical ...

Keywords: Concurrent programs, fault-tolerance, program synthesis, specification, temporal logic

18 Cryptography and data security

Dorothy Elizabeth Robling Denning

January 1982 Book

Publisher: Addison-Wesley Longman Publishing Co., Inc.

Full text available: pdf(19.47 MB)   Additional Information: full citation, abstract, references, citings, index

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From the Preface (See Front Matter for full Preface)

Electronic computers have evolved from exiguous experimental enterprises in the 1940s to prolific practical data processing systems in the 1980s. As we have come to rely on these systems to process and store data, we have also come to wonder about their ability to protect valuable data.

Data security is the science and study of methods of protecting data in computer and communication systems from unauthorized disclosure ...

19 <u>Verification techniques for cache coherence protocols</u>   ■
Fong Pong, Michel Dubois
March 1997 **ACM Computing Surveys (CSUR)**, Volume 29 Issue 1
Publisher: ACM Press

Full text available: 🔖 <u>pdf(1.25 MB)</u>   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

In this article we present a comprehensive survey of various approaches for the verification of cache coherence protocols based on state enumeration, (symbolic model checking, and symbolic state models. Since these techniques search the state space of the protocol exhaustively, the amount of memory required to manipulate that state information and the verification time grow very fast with the number of processors and the complexity of the protocol mechanism ...

Keywords: cache coherence, finite state machine, protocol verification, shared-memory multiprocessors, state representation and expansion

20 <u>Architecture: Leveraging cache coherence in active memory systems</u>   ■
Daehyun Kim, Mainak Chaudhuri, Mark Heinrich
June 2002 **Proceedings of the 16th international conference on Supercomputing ICS '02**
Publisher: ACM Press

Full text available: 🔖 <u>pdf(217.27 KB)</u>   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

Active memory systems help processors overcome the memory wall when applications exhibit poor cache behavior. They consist of either active memory elements that perform data parallel computations in the memory system itself, or an active memory controller that supports address re-mapping techniques that improve data locality. Both active memory approaches create coherence problems---even on uniprocessor systems---since there are either additional processors operating on the data directly, or the ...

Keywords: active memory, address re-mapping, cache coherence

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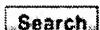
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van der Wal, E.;
The Application of IEC 61131 to Industrial Control: Improve Your Bottom Line
Value Industrial Control Systems (Ref. No. 1999/076), IEE Colloquium on
30 March 1999 Page(s):2/1 - 2/8

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Open Control in the Process and Manufacturing Indusgtries (Digest No. 1998/2
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Hamilton, A.;

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Song-Gui Shu;
Systems Engineering, 1989., IEEE International Conference on
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☐ 2. **Installation of an integrated turbine-generator control system for a pulp n**
Weaver, M.D.; Hilder, S.; Brown, D.R.;
Industry Applications, IEEE Transactions on
Volume 39, Issue 3, May-June 2003 Page(s):899 - 909
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AbstractPlus | Full Text: PDF(1056 KB)   IEEE CNF
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Zhi Wang; Tianran Wang; Mingzhe Yuan; Haibin Yu;
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